BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

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| In the Matter of the Application of | ) | |
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| PUBLIC UTILITIES COMMISSION | ) | DOCKET NO. 2008-0273 |
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| Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs. | ) | |
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**THE SOLAR ALLIANCE'S AND HAWAII SOLAR ENERGY ASSOCIATION'S OPENING BRIEF**

**AND**

**CERTIFICATE OF SERVICE**

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**THE SOLAR ALLIANCE'S AND HAWAII SOLAR ENERGY ASSOCIATION'S**
OPENING BRIEF

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF HAWAII:

Pursuant to the Hawaii Public Utilities Commission's (the "Commission") Order Granting The County Of Hawaii's Motion For Approval To Amend its Status As An Intervener To A Participant, Filed On April 8, 2009; Granting The City And County Of Honolulu's Motion For Approval To Amend its Status As An Intervener To A Participant, Filed On April 8, 2009; Amending Hawaii Holdings, LLC, Doing Business As First Wind And Sempra Generation's Status As Interveners To Participants; And Amending The Schedule In This Proceedings, filed herein on April 27, 2009, as Modified, The Solar Alliance ("SA") and Hawaii Solar Energy Association ("HSEA") (herein after jointly referred to as "SA/HSEA") hereby submits to the Commission its Opening Brief.

***1. Introduction.***

This Investigation was opened by the Commission pursuant to a Comprehensive Energy Agreement that was entered into by the Governor of the State of Hawaii, the State of Hawaii Department of Business, Economic Development and Tourism ("DBEDT"), the State of Hawaii

Division of Consumer Advocacy of the Department of the Commerce and Consumer Affairs ("CA") and the HECO Companies. According to the signatories to the Energy Agreement, the Energy Agreement was designed to move the State away from its dependence on imported fossil fuels for electricity and ground transportation, toward indigenously produced renewable energy and an ethic of energy efficiency.

As part of the Agreement, the HECO Companies committed to implement feed-in tariffs to dramatically accelerate the addition of renewable energy from new sources and to encourage increased development of alternative energy projects.

SA/HSEA are strong supporters of moving the State of Hawaii's intention to reduce its dependence on imported fossil fuels to produce electricity. Each organization has, for years promoted the use of renewable energy in general, and solar photovoltaics ("PV") in particular because of its many benefits to the State's environment and economy. SA/HSEA believes that PV technology is a natural fit for FIT - it is a proven technology with a robust track record in the State of Hawaii, and enjoys widespread appeal among commercial and residential power users. In addition, its project sizes and characteristics lend themselves to the use of standardized energy rates, power purchase contracting, and streamlined interconnection to the grids of the HECO Companies.

In this proceeding the Commission is charged with the task of determining the best design for a FIT that supports the goals of the Hawaii Clean Energy Initiative, while remaining consistent with the traditional regulatory imperative of ensures that ratepayers will retain access to reliable energy sources at a just and reasonable rate. SA/HSEA hopes that its participation in this proceeding has assisted the Commission by providing evidence that shows that with PV as an eligible technology in the FIT program, the Commission is able to meet all of its goals. PV is truly a renewable technology that is "shovel ready" for FIT.

### 2. *The Role of Feed-in Tariffs in achieving Hawaii's renewable energy goal as articulated in the Hawaii Clean Energy Initiative.*

A properly designed Feed-in Tariff ("FIT") will accelerate the acquisition of renewable energy by the Hawaii Electric Company, Inc., Maui Electric Company, Ltd., and Hawaii Electric Light Company, Inc. (hereinafter jointly referred to as the "HECO Companies"). In doing so, FIT will help achieve the Hawaii Clean Energy Initiative ("HCEI") goal of reducing Hawaii's dependence on imported fossil fuel by meeting at least 70% of the State's energy needs with clean renewable resources by 2030. Properly implemented FITs offer both the developer and ratepayers predictability and certainty with respect to the future prices to be paid for renewable energy. This certainty reduces the amount of time and money the developer and HECO Companies have to spend determining price and interconnection terms and conditions of the Power Purchase Agreement. In doing so, they reduce the risk, and hence the cost, of non-utility generated power. In essence, the FIT is a standard offer contract that reduces the transaction costs that both the developer and HECO Companies face in determining whether a project makes economic sense and, if so, at what price.[1]

Although the ratepayers may experience an increase in rates in the short-run, in the long run (the 20 year term of the FIT contract[2]), the ratepayer will benefit from: (i) the utility's ability to procure power at a known cost that are derived from the cost of money in the base year and not derived from or linked to the unstable price of oil; (ii) a decrease in rates based on historical rates of utility price appreciation, that will likely be even larger in the face of factors such as the predicted increase in oil prices, the impending addition of various carbon taxation/pricing schemes; (iii) economic growth generally because the use of renewables, especially distributed PV will create an economically sustainable source of "green collar" jobs in the State of Hawaii;

[1] Tr. Vol. V at 131, lines 7-11.
[2] During Settlement negotiations all parties reached agreement on a 20 year term for FIT contracts.

and economic growth due to reduced export of dollars earned in the State being exported to purchase fossil fuels.[3]

### 3. *The Role of Net Energy Metering in achieving Hawaii's renewable energy goal as articulated in the Hawaii Clean Energy Initiative.*

SA/HSEA steadfastly supports retaining Net Energy Metering ("NEM") alongside a FIT as an option for both existing customer generators and future customer generators.[4] The role of NEM and FIT in the marketplace for distributed power production are very different. NEM addresses the need of many homeowning and businessowning ratepayers to manage their operating costs. FIT is a mechanism for deriving income from the production of energy. As a result, different types of customer-generators are best served by different programs and the overall market is best served by giving ratepayers access to both options.

The distinct situations of customer-generators under FIT and NEM can best be understood by noting that under current rules, net-metered customer-generators are incapable of entering the energy production *business* because they cannot be compensated for annual aggregate production in excess of annual aggregate usage. This clarifies that NEM is a mechanism for the customer generator to manage the operating costs of his/her home or business but precludes him/her from deriving additional financial benefit. In contrast, a customer-generator under a feed-in tariff has the option of investing in generating equipment at whatever level his/her financial resources and physical site can accommodate and entering the energy production business.[5]

In order to most aggressively meet the State's renewable energy goals NEM can and

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[3] See, Response to HECO/Solar Alliance-IR-7 filed on March 13, 2009.
[4] SA/HSEA's position is consistent with Exhibit A of the Energy Agreement which allows for the continuation of NEM for both existing and future eligible customer-generators.
[5] This distinction is best illustrated by the three examples provided in SA/HSEA's FSOP at 7-8. See also, Tr. Vol. 1 at 141, lines 18-25.

should be permitted to continue as "NEM + FIT." In this configuration, the option to be compensated at the FIT rate for annual excess generation will induce entities to install more renewable energy generating capacity than under either NEM or FIT alone.

For all of these reasons, NEM should not be phased-out. Rather, pursuant to Section 19 of the Hawaii Clean Energy Agreement ("Energy Agreement") it should be expanded as follows:

> The parties are in agreement that there should be no system-wide caps on net energy metering at any of the Hawaiian Electric utilities. Instead, the parties agree to the following:
>
> - Distributed generation interconnection will be limited on a per-circuit basis, where generation (including PV, micro wind, internal combustion engines, and net metered generation) feeding into the circuit shall be limited to no more than 15% of peak circuit demand for all distribution-level circuits of 12 kV or lower;
>
> - New DG requests shall be processed and interconnected on a first-come, first-served basis unless the Commission specified some other method;
>
> - For those circuits where interconnection requests (particularly for PV approach the 15% limit, the utility will perform and complete within 60-days after receipt of an interconnection request, a circuit-specific analysis to determine whether the limit can be increased. For non inverter-based DGs, the analysis to determine whether the limit can be increased will be performed on a case-by-case basis based on the specifics of the DG project(s) proposed;
>
> If the utility believes a specific DG installation poses a significant risk to circuit reliability and safety or grid stability, it will notify the applicant, the Consumer Advocate and the Commission, within 30 days from receipt of the completion of a circuit analysis and the identification of the need to defer the installation until further analysis can be conducted, and shall conduct that analysis within no more than three months from the date of the application request.[6]

NEM has a proven track record in Hawaii in promoting the use of renewable energy by

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[6] *See*, Energy Agreement, Section 19 at 28. In the Energy Agreement, it stated that, "NEM currently provides an interim measure to encourage the installation of and pay for renewable energy generated from customer-sited systems, generally PV systems. The parties agree that NEM will be replaced with an appropriate feed-in tariff and new net metered installations shall be required to incorporate time-of-use metering equipment and, when time-of-use rates are implemented on a full scale basis in Hawaii or the applicable area, the net metered customer shall move to time of use net metering and sale of excess energy." However, in their Final Statement of Positions in this Docket, the HECO Companies and the Consumer Advocate stated, "Based upon discussions during the course of this proceeding, the HECO Companies and Consumer Advocate propose that the NEM program, as described in Section 19 of the HCEI Agreement, should be offered until the first FIT Update discussed herein is completed, two years after FIT implementation. HECO and CA FSOP at 15. It is SA/HSEA's position that NEM should continue indefinitely.

residential ratepayers, with penetration levels growing exponentially since its introduction in 2001.[7] NEM induces more entities to install renewable energy systems and reduce their demands on the power grid. NEM is an important tool to assist the State to reach its ambitious clean energy goals.[8]

When NEM without artificial restrictive caps is in place, power users have a substantial incentive to install more generating equipment than they need to merely offset their instantaneous daytime usage. By making NEM available to more customers through expansion of both the system-wide and system size caps. NEM induces more firms to install renewable energy systems and reduce their demands on the power grid. This is an important step that will help enable the state to reach its ambitious clean energy goals.

Finally, allegations about NEM customers receiving subsidies because they do not pay for their share of the utilities fixed cost are, at best unsubstantiated, and will likely prove baseless because (i) the amount involved, if any, is nominal; (ii) "washes away depending on the outcome of the decoupling docket"[9] ; and (iii) is offset by the benefits NEM brings to the utility system.[10]

***4. FIT Eligibility Criteria – technologies and project sizes.***

SA/HSEA originally recommended that FIT be available to numerous technologies with generators up to 20MW.[11] However, based on discussions after the Panel Hearing in this Docket that were intended to reach consensus between the intervener parties and HECO/CA, SA/HSEA now supports the HECO/CA proposal that the FIT initially be eligible only for the following

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[7] See, Tr. Vol. 1 at 109, lines 19-25.
[8] As HECO/CA eloquently stated in its FSOP, "In order to achieve the State's renewable energy objective as a whole, the State should avail itself of the many different tools it has available." See, HECO/CA FSOP at 5, ftn. 3. SA/HSEA believes that one of the effective tools is NEM.
[9] Tr. Vol. 1 at 136, line 25 and 137, line 1.
[10] Tr. Vol. 1 at 128.
[11] See SA's and HSEA's Proposal for Feed-in Tariff Design, Policies, and Pricing Methods attached as Appendix "A" to their Opening Statement of Positions. SA's and HSEA's proposal was based on a collaborative document with several other intervenors in this Docket.

technologies:

- Solar PV/CSP[12]
- Wind
- Hydro (in-line).[13]

SA/HSEA's support for this more limited menu of technologies for the period between the introduction of the FIT and the time of the first review of the FIT is (1) an effort to reach consensus with the HECO Companies and the Consumer Advocate and (2) a response to evidence from the Panel Hearing in this Docket suggesting that these are the only technologies that are "shovel ready" at this time. During the Panel Hearing Moderator Adam Pollock acknowledged that, "clearly PV is the most developed of the relatively small in size technologies"[14]

SA/HSEA's strong support for PV as an eligible technology is derived, as discussed in their Final Statement of Position ("FSOP")[15], from the fact that renewable energy derived in part from the fact that PV has been shown to have a positive impact on the utility's system's grid. Thus allowing PV generators to be eligible for FIT as proposed by SA/HSEA will not have a negative impact on the HECO Companies reliability and/or power quality. Numerous Hawaii studies have concluded that PV invertors positively contribute to the feeder voltage regulation and result in an improved voltage profile. Studies conducted elsewhere indicate that at higher

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[12] In collaboration with Sopogy Inc., SA/HSEA propose that the following definitions be adopted by the Commission for Solar PV and Solar CSP:

"Photovoltaic Generating Facility" means a Renewable Energy Generating Facility that generates electricity from sunlight.

"Concentrating Solar Power Facility" means a Renewable Energy Generating Facility that uses mirrors to concentrate the sun's heat in order to generate electricity. *See,* SA/HSEA's Submissions of Information filed on May 8, 2009 in this proceeding.

[13] SA/HSEA is open to inclusion of Biomass/Biogas as part of an initial FIT to the extent that there is appropriate evidence in the record regarding pricing, the ability to standardize terms and the viability of this technology at eligible sizes, to support inclusion at this time.

[14] Tr. Vol. V at 111, lines 4-5.

[15] *See,* SA/HREA's FSOP at 10.

penetration levels, PV invertors actually provide feeder voltage support.[16]

The HSEA expert also testified at the Panel Hearing,

> It would also seem to me to be the case that distributed renewables interconnected to the grid can actually improve the system black start capability. For example, a system wide outage on Oahu that occurred in a context where Hawaii Kai had a substantial penetration of the PV, the power supply from the PV systems would help Hawaii Kai first. And then others in East Oahu – other communities in East Oahu get back online sooner by helping fill the system from both ends rather than only in one direction.[17]

Also, based on "settlement" discussions after the Panel Hearing in this Docket, SA/HSEA is proposing that the initial FIT shall include renewable generation with capacity size up to 5MW for Oahu, and up to 2.75MW each for HELCO and MECO. SA/HSEA offers this proposal because: (i) it provides a compromise between the capacity size offered by HECO/CA and various interveners[18] during the Panel Hearing; (ii) most importantly it will cover the current void between NEM limits and the minimum size threshold for the Competitive Bidding Framework; and (iii) it is larger enough to make a meaningful impact to the renewable energy market by drawing more PV developers.[19]

***5. SA/HSEA's proposed specific FIT rates for eligible PV generators.***

***A. SA/HSEA's proposed specific FIT rates for eligible PV generators are just and reasonable.***

As stated in their FSOP, the proposed specific FIT rates by SA/HSEA in their respective Proposal for Feed-in Tariff Design, Policies, and Pricing Methods attached as Appendix "A" to their respective Opening Statement of Positions are offered on the premise that, in order for a

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[16] *See,* Distribution System Voltage Performance Analysis for High-Penetration Photovoltaics. NREL/SR-581-42298, February 2008; HECO's Ramp Rate Performance Standard for Intermittent Generation on the HECO System, March 14, 2008 at 8-10; Big Island Energy Road Map – Status, Terry Surles, Hawaii Natural Energy Institute, October 17, 2007; and Technology Issues in Renewable Energy and Energy Efficiency, presented to the Hawaii State Legislature by Richard Rocheleau, Hawaii Natural Energy Institute, January 22, 2009.

[17] Tr. Vol. V at 188, lines 17-25 and at 189, line 1.

[18] These intervenors included SA and HSEA.

[19] During the Panel Hearing the HECO Companies admitted that they do not have any reliability standards or metrics to support the numbers it proposed in its FSOP. *See,* Tr. Vol. 1 at 206, lines 19-21.

feed-in tariff to be a meaningful mechanism for accelerating the state toward attainment of its clean energy goals, it must offer investors a risk-adjusted rate of return sufficient to induce them to invest in PV projects in the State of Hawaii. This premise is based on SA/HSEA's knowledge of attempts to introduce FIT in other jurisdictions, which revealed that a FIT's ability to induce investment in a specific type of renewable energy project is subject to threshold effects wherein below the requisite threshold price investment levels will be zero, and once the threshold price is reached investment will rapidly commence.

In this context, SA/HSEA believe that the best currently available evidence for what this price threshold is for PV in Hawaii comes from ten projects on three islands that were developed at the end of 2008 and funded using only federal tax credits.[20] The left panel of Table 1, below, presents pricing from these projects, in which the State of Hawaii agreed to buy power under a 20-year power purchase arrangement with an investment group.

SA/HSEA's proposed FIT rates are derived from these rates by levelizing them over a 20-year period to conform with standard FIT design in which FIT rates do not include any escalation. (The third party financed rates start lower and escalate over the life of the agreement.) These levelized rates are then adjusted upwards or downwards depending on system size (higher systems lead to lower costs due to economies of scale in installation and materials acquisition) and island (Neighbor Island installation costs exceed those on Oahu by varying amounts). The mechanics of these adjustments were covered in detail in SA's response to HECO/Solar Alliance-IR-21.

In order to provide some degree of comparison, Table 1 presents the "Average Rate over 20 years" column, which is a simple arithmetic average of the annual prices the State will pay

[20] SA/HSEA's illustration does not include the State Renewable Energy Technologies Income Tax Credit because investors have not be able to monetize it.

over the 20 year contract term. The panel on the right lists SA/HSEA's proposed FIT rates by island for systems in the same size classes. Comparing the left and right panels of Table 1 indicates that SA/HSEA's FIT rates are at or below the prices on third party financed contracts that the State of Hawaii has signed recently.

In summary, the SA/HSEA rates are specifically crafted so that they exhibit a highly favorable property of any FIT rate that is intended to accelerate the penetration of renewables on Hawaii's electric utility grids. That is, they are based on actual recent market intelligence as to the specific prices that investors need to receive in order to deploy capital to support investments in PV projects in Hawaii.

| Executed Third Party Financed PV Projects (No State Tax Credit) | | | | | Proposed FIT Rates 3% Escalation over 20 year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | PV System Size | Baseline rate $/kWh | Annual Escalation | Average Rate over 20 years | System Size kW | Oahu | Maui | Molokai | Lanai | Hawaii |
| Kauai- Airport | 154 | 0.38 | 2% | 0.4617 | 100 to 500 | $ 0.396 | $ 0.436 | $ 0.475 | $ 0.475 | $ 0.444 |
| Kauai- Airport | 112 | 0.38 | 2% | 0.4617 | 100 to 500 | $ 0.396 | $ 0.436 | $ 0.475 | $ 0.475 | $ 0.444 |
| Kauai- Airport | 35 | 0.38 | 2% | 0.4617 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |
| Kauai- Airport | 35 | 0.38 | 2% | 0.4617 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |
| Kauai-Highways | 98 | 0.38 | 2% | 0.4617 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |
| Kauai - Harbors | 30 | 0.38 | 2% | 0.4617 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |
| Hilo Airport | 112 | 0.33 | 3% | 0.4434 | 100 to 500 | $ 0.396 | $ 0.436 | $ 0.475 | $ 0.475 | $ 0.444 |
| Kona Airport | 60 | 0.32 | 3% | 0.4299 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |
| Kahului - Airport | 112 | 0.32 | 3% | 0.4299 | 100 to 500 | $ 0.396 | $ 0.436 | $ 0.475 | $ 0.475 | $ 0.444 |
| Kahului - Airport | 31 | 0.32 | 3% | 0.4299 | 11 to 100 | $ 0.436 | $ 0.479 | $ 0.523 | $ 0.523 | $ 0.488 |

An alternative to the mechanism proposed by SA/HSEA in its previous filings is for the Commission to determine rate levels that are 'just and reasonable' by examining cost data and building in an allowable level of profit. Throughout this proceeding, SA/HSEA have consistently noted that doing so is challenging because the existing regulatory restrictions on the size of PV systems mean that for many of the project sizes contemplated under an FIT there is no extant, Hawaii based source of cost data. SA/HSEA note that given this gap, it may be possible to use industry standard data and adjust these for Hawaii. SA/HSEA note that the most comprehensive and recently developed source of such data is a report from Lawrence Berkeley National Laboratory.[21] Assuming the Commission seeks to pursue a cost plus reasonable profit-based approach, SA/HSEA would support the use of costs derived from this report as adjusted for the cost of doing business in Hawaii.

Additionally, if the Commission chooses this route, SA/HSEA note that the standard by which a profit is "reasonable" is a function of the risk associated with pursuing it. To this end,

[21] Wiser, R., Barbose, G. and C. Peterman. 2009. Tracking the Sun: The Installed Cost of Photovoltaics in the US from 1998-2007. Lawrence Berkeley National Laboratory report LBNL-1516E. February 27.

the HECO Companies' 10.67 percent riskless profit level should serve as a sub-baseline level of reasonability. That is, no developers can invest in generating systems risklessly under the FIT (or otherwise), and the compensation required to induce investment would need to be meaningfully higher than the 10.67 percent level. How much higher depends on the risk to the developer embedded in the ultimate structure of the FIT.

### *B. SA/HSEA's proposed specific FIT rates for eligible PV generators will not result in increased rates to the ratepayers in the long run.*

As stated in their FSOP, the proposed FIT rates by SA/HSEA in their respective Proposal for Feed-in Tariff Design, Policies, and Pricing Methods attached as Appendix "A" to their respective Opening Statement of Positions will not result in increased rates to the ratepayers in the long run. The utility ratepayers may experience a rate increase in the short-run, but over the course of 20 year FIT contracts utility ratepayers will experience: (i) stable and set rates; (ii) a decrease in rates, especially if the price of oil keeps rising in the next 20 years; and (iii) economic growth more generally because the use of PV will create a vigorous renewable energy industry in the state; because business owners will have more capital to invest in revenue generating activities in the state; and because reducing the amount of money exported from the state to purchase fossil fuels will leave more to circulate locally.

As the HSEA expert stated during the Panel Hearing,

> the tendency to focus on the near term, I'd say, is understandable, but we didn't focus much – in much depth on the longer-term issues.
>
> So what this does is that it – it sort of belies the fact that if you focus on the near term, under very reasonable assumptions you could get pretty soon – or I would argue you would get pretty soon – levelized feed-in tariff rates that are currently above the -- pardon me – levelize rates above the retail rate that are pretty quickly surpassed by the actual retail rate.
>
> It's also not unreasonable to imagine that in the – that the avoided cost in the traditional purpose sense would surpass the feed-in tariff levelized rate

somewhere near the middle of the contract, and possibly much sooner based on some kind of one-off geopolitical event.

So I guess this is just a plea for the full consideration of the long- and short-term relative cost of the FIT... ."[22]

The chart below indicates how the FIT rates proposed match up to retail cost of energy based on "business as usual" (i.e., continued historical rates of grid power price escalation) by the utility. (It is appropriate to compare the proposed FIT rates to the projected retail rate for the purpose of ascertaining rate payer impacts because PV systems, as distributed sources of energy, send exported electrons to the nearest source of load on the system. The cost differential to the receiving customer is therefore the difference between the retail and FIT rates.)

| Utility | Rate Class | Year the FIT energy cost falls below the utility cost | Number of years that FIT Energy cost falls BELOW the utility cost |
|---|---|---|---|
| HECO | Residntl | 2020 | 10 |
| | G rate | 2019 | 11 |
| | J Rate | 2020 | 10 |
| | P rate | 2020 | 10 |
| MECO | Residntl | 2017 | 13 |
| | G rate | 2015 | 15 |
| | J Rate | 2015 | 15 |
| | P rate | 2015 | 15 |
| Molokai | Residntl | 2016 | 14 |
| | G rate | 2011 | 19 |
| | J Rate | 2013 | 17 |
| | P rate | 2014 | 16 |
| Lanai | Residntl | 2017 | 13 |
| | G rate | 2013 | 17 |
| | J Rate | 2012 | 18 |
| | P rate | 2013 | 17 |
| HELCO | Residntl | 2015 | 15 |
| | G rate | 2012 | 18 |
| | J Rate | 2014 | 16 |
| | P rate | 2014 | 16 |

Note: The tables are based on the following assumptions:

[22] Tr. Vol. V at 186, lines 20-25 and at 187, lines 1-10.

Hypothetical System Size/Cost/Production

| System Size kW | Sun Hours | De-rate | First year Annual kWh | 20 year total kWh |
|---|---|---|---|---|
| 10 | 5.4 | 0.77 | 15,177 | 303,269 |
| 100 | 5.4 | 0.77 | 151,767 | 3,032,686 |
| 500 | 5.4 | 0.77 | 758,835 | 15,163,431 |
| 1000 | 5.4 | 0.77 | 1,517,670 | 30,326,863 |

1. "Business as usual" cost of energy was based on 2007 Average Electric Rates from the HECO website. This rate was escalated at 6.5% per year over the 20 life of the FIT contract. Business as usual does not include potential significant lumpy increases due to Decoupling, CEIS, i.e. underwater sea cable, smart grid, etc.

All the systems are installed in January 1, 2010.

The projected kWh and the projected cents per KWH were multiplied to derive the $ dollar value of the energy produce per year.

Transmission and distribution cost/changes are not considered factors since the Utility will recover these costs via the CEIS and Decoupling.

Thus, over the life of the 20 Year FIT agreements all the rate classes would experience a reduced cost of energy versus the utility business as usual cost of energy.[23]

### *6. Interconnection.*

#### *A. HECO Companies' Rule 14.*

As stated in their Opening and Final Statement of Positions, SA/HSEA proposes that changes should be made to HECO Companies' Rule 14 in order to encourage more renewable generators, as envisioned in the Energy Agreement.

One such area of concern is *Rule 14, Appendix I, Section 2. General Interconnection Guidelines d. Utility Feeder Penetration.* This section introduces a ten percent feeder penetration limit. A limit at this level is at odds with the proposal in the Energy Agreement which indicates that distribution level circuit penetration be set initially at 15%. The specific language of the Agreement is as follows:

[23] Workpapers are available upon request.

> • Distributed generation interconnection will be limited on a per-circuit basis, where generation (including PV, micro wind, internal combustion engines, and net metered generation) feeding into the circuit shall be limited to no more than **15% of peak circuit demand for all distribution-level circuits of 12kV or lower;**[24]

SA/HSEA does not necessarily agree that 15% should serve as an upper limit on per-circuit distributed generation. However, SA/HSEA believes that the fact that the HECO Companies agreed to this level indicates that such levels will not engender reliability or stability problems, and would therefore constitute a reasonable place to begin.

SA/HSEA would like to emphasize that the proposal here, as derived from the Energy Agreement, is for 15% of peak circuit demand of all distribution level circuits of 12 kV or lower. In the HECO Companies' activities, "distribution level circuits" have not always been defined as being equivalent to "feeder distribution" for purposes of determining the need for an IRS. For this purpose, at least HELCO has defined "utility feeder" as the line running from the substation to a set of customers.

This more restrictive definition may or may not be different from the Commission's intention where it defines "feeder penetration" in Rule 14, Appendix I, Section 2, General Interconnection Guidelines, (d) Utility Feeder Guidelines. In any case, SA/HSEA notes that there is no publicly available information regarding the configuration of circuits or "feeder circuits," however defined, and that this makes it impossible to know the penetration of a given feeder in advance of the proposal for a specific project. This lack of transparency has substantial marketplace impacts as the time frame to complete an IRS is unknown and can not only delay completion but shift placed-in-service dates into subsequent tax years, which undermines project funding given the tax incentive support for PV projects.

SA/HSEA's second concern with Rule 14 deals with *Section 3 Design*

[24] See Section 19 at p. 28 (emphasis added).

*Requirements, f. Supervisory control.* This section states that the utility may require computerized remote control for any generating facilities with an aggregate capacity of more than 1MW. This requirement creates a *de facto* system size limit that investors may not be willing to exceed, due to fears of incurring unknown levels of additional cost, study requirements, and/or remote curtailment. Each of these factors has the ability to substantially alter the financial performance of an investment in renewable energy and the lack of clarity on these issues will serve as a disincentive to investment in projects over 1 MW, irrespective of factors such as customer load and availability of investment funds that ought to determine system sizes.

### *B. Allocation of Interconnection Costs.*

1. Interconnection Standards, Procedures, and Costs Allocation
   - Interconnection costs and challenges vary based partly on project size
   - A tiered approach to interconnection cost sharing can reflect these size-based costs/challenges and appropriately allocate costs between developer/utility

> "there needs to be an economic cap in order to really. . .there's different penetration levels of megawatts per island. And we talked about a potential tiering. So the cap, the penetration level could be done at different tier levels. And X amount of megawatt, it could be megawatt hours because it depends on site, site location. You could have a 1-megawatt system in a cloudy area, and it would have less megawatt-hour implications to the ratepayer.
>
> And once that megawatt hour are reached, or potential megawatts by the proposal of the developers, then the feed-in tariff rate would decline. And therefore, you would have an economic cap.
>
> And I believe that's very important to protect the ratepayer and also allow developers to become more efficient, more cost-effective as the economic activity of installing photovoltaic systems and levels become more efficient.
>
> . . .and it should be by island also because each island has a different rate calculation, different cost calculation."[25]

During the Panel Hearing, SA's expert Mr. Saito explained the proposed tier approach as follows;

[25] Tr. Vol. V at 78, lines 22-25 and 79, 1-19.

I'm looking at a three-tier approach to the FIT rate. The first tier is as the company proposed, and in that it would be 500 kW or less for Oahu, 250/250 [kW], Maui and the Big Island.

And should a IRA [sic] be required, the utility would cover that cost. And with that the stability questions from – that I gathered is that engineering cost would not be expected. Equipment, additional interconnect equipment wouldn't be expected. There would be no security elements regarding curtailment, dispatchability, voltage, frequency, fault, SCADA requirement.

Now, if you to the second tier, which would be one megawatt or less for Oahu, 500/500 [kW] for Maui and the Big Island, yer, there would more than likely, from what I can gather, require an IRS study. And that would be borne by the developer.

The possibility of engineering is – it is possible but – you know, it's a 50/50 that engineering work would be required.

Equipment, more than likely not. So – but if it is required, the developer would bear that cost. But in approaching a – a development of that type of project generally, from my experience, that it wouldn't be required. And in that there would be no security, real security issues, unless it's at the end of a 4 kV line. But curtailment, dispatchability, voltage, frequency, fault, SCADA and those elements would not be required.

Now, moving to Tier 3, this is 5 megawatts and below for Oahu, one megawatt for Big Island, one megawatt for Maui.[26] Definitely needing an IRS. And that is pretty much known cost right now as we work through current methods of PPAs negotiations.

And so that would be anywhere from 30-50 thousand to a hundred thousand dollars. So the developer can budget for that amount. The – there'll more than likely be engineering cost and equipment cost associated; and thus, the elements of security, curtailment, dispatchability, voltage, frequency, fault, SCADA would be required.

And some of those elements – those elements are known to developers and to the utility as far as the cost. So comparing the actual FIT rate that's available for that class, they would be able to pencil out the economics and see if it's worth proposing an application for the FIT.

The – what the FIT does in the overall contract of the – body of the contract, provides the term, the rate and a standardization of several items regarding insurance indemnification, permits, metering, personal safety, the seller payments, for force majeure, all these other elements that can be standardized in a FIT contract, which the Commission could approve ahead of time and allow these other – the rates, the site control security elements, all be handled in exhibits.[27]

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[26]

[27] Tr. Vol. V at 195-197.

In response to a question from Commissioner Kondo, Mr. Saito indicated his intention that in Tier 3, the engineering and equipment cost would be borne by the developer.[28] However, after the Panel Hearing DBEDT recommended that the utility should bear such cost because they would own the equipment. SA/HSEA does not object to DBEDT's proposal as long as it does not delay the deployment of these Tier 3 generators. In addition, SA/HSEA would also like to clarify that whether or not it is economically feasible for the developer to purchase ancillary equipment required to interconnect the system may depend on whether the system is interconnected at the transmission or distribution levels. Required purchase of transmission level equipment may indeed make all but the largest projects uneconomic.

Also, for Tier 3, SA/HSEA is no longer proposing 1MW for HELCO and MECO as it did during the Panel Hearing. To be consistent with the minimum threshold for competitive bidding and to fill the cap between competitive bidding and NEM, SA/HSEA is proposing that 2.75 MW be the cap for HELCO and MECO.

| | Tier 1 | Tier 2 | Tier 3 |
|---|---|---|---|
| | **PROJECT SIZES (kW)** | | |
| **Oahu** | 1 - 500 kW | 501-1000 kW | 1001-5000 kW |
| **Maui & Hawaii** | 1 - 250 kW | 251-500 kW | 501 -2750 kW |
| **Lanai & Molokai** | 1 - 100 kW | 101-250 kW | 251 - 500 kW |
| | **INTERCONNECTION FEATURES & STANDARDS** | | |
| **Curtailable** | No | No | Yes |
| **Dispatchability** | No | No | Yes |
| **Voltage Regulation** | None | None | Yes |

[28] Tr. Vol. V at 197, lines 18-21.

| | | | |
|---|---|---|---|
| **Frequency Regulation** | None | None | Yes |
| **SCADA** | None | None | Yes |
| | **ALLOCATION OF INTERCONNECTION COSTS** | | |
| **Interconnection Review Study (IRS) Costs** | Utility | Utility | Developer |
| **System and feeder studies and technology verification studies performed by the utility** | Utility | Utility | Utility |
| **Project risk assessment costs including costs associated with curtailment studies** | Utility | Utility | 50% utility-borne, and 50% developer-borne |
| **Line extension and transformation equipment specific to the project** | Developer | Developer | Developer |
| **Substation specific to the project** | Utility | Utility | Utility |
| **Equipment installed at the customer site specific to the project** | Developer | Developer | Developer |
| **SCADA, control system, and curtailment system specific to the project** | Utility | Utility | Developer |
| **Utility system costs and upgrades** | Utility | Utility | Utility |

### *7. Annual FIT Targets and Goals*

In order to reach the Energy Agreement's target of 70% renewable energy by 2030 and at the same time manage and assess the rate impact of FIT, SA/HSEA recommends that the Commission establish annual targets/caps. SA/HSEA proposes that the Commission set the initial distribution level goals at 15% of the 2008 peak demand of each utility. Although SA/HSEA are not aware of any evidence that suggests that 15% should serve as an upper bound on the circuit level penetration of distributed generation, this is the level proposed in the Energy Agreement.[29] Given this, SA/HSEA assume that penetration at this level does not present significant concerns to the HECO Companies.

In addition, SA/HSEA propose that the goal for transmission level FIT should be an additional 15 percent of peak circuit level demand. This level is based primarily on the HECO Companies' claim that the problems they face in interconnecting generation under the FIT stem primarily from the potential for reverse power feeding from generating sources interconnected at the distribution level. Because resources interconnected at the transmission level provide one-way power flow, SA/HSEA assumes that any actual or hypothesized problems posed by distribution circuit level resources will not beset those interconnected at the transmission level. As a result, SA/HSEA are assuming that capacity to safely interconnect these resources at the transmission level should be at least as high as at the distribution level.

### *8. SA/HSEA's proposed Pricing and Market Penetration Framework.*

As discussed during the Panel Hearing and in its Submissions of Information, SA/HSEA proposes that the Commission adopt a Pricing and Market Penetration Framework based on

[29] *See,* Section 19 at p. 28.

penetration digression as PV systems are installed. This allows quantification of the cost impact and will ensure that the rates to ratepayers will be just and reasonable. See example below. [30] FIT Tariff can be modeled with at lower starting rate and have an escalation component, while still providing the investor with a reasonable rate of return.

**FIT Rate**

**Penetration Digression EXAMPLE**

| Oahu | | | | | |
|---|---|---|---|---|---|
| Step One | | > 10 kW | >100 kW | >500 kW | >5000 kW |
| Rates | | 0.479 | 0.436 | 0.396 | 0.363 |
| kW | 37,000 | 2000 | 5000 | 10000 | 20000 |
| kWh | 56,153,790 | 3,035,340 | 7,588,350 | 15,176,700 | 30,353,400 |
| First year cost | $ 21,790,705.86 | $ 1,453,928 | $ 3,308,521 | $ 6,009,973 | $ 11,018,284 |
| Step Two | | | | | |
| Rates | | 0.4311 | 0.3924 | 0.3564 | 0.3267 |
| kW | 37,000 | 2000 | 5000 | 10000 | 20000 |
| kWh | 56,153,790 | 3,035,340 | 7,588,350 | 15,176,700 | 30,353,400 |
| First year cost | $ 19,611,635.27 | $ 1,308,535 | $ 2,977,669 | $ 5,408,976 | $ 9,916,456 |
| Step Three | | | | | |
| Rates | | 0.38799 | 0.35316 | 0.32076 | 0.29403 |
| kW | 34,000 | 2000 | 2000 | 10000 | 20000 |
| kWh | 51,600,780 | 3,035,340 | 3,035,340 | 15,176,700 | 30,353,400 |
| First year cost | $ 16,042,530.74 | $ 1,177,682 | $ 1,071,961 | $ 4,868,078 | $ 8,924,810 |

| Maui | | | | | |
|---|---|---|---|---|---|
| Step One | | > 10 kW | >100 kW | >500 kW | >5000 kW |
| Rates | | 0.527 | 0.479 | 0.436 | 0.399 |
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 12,417,575.94 | $ 1,599,624 | $ 1,453,928 | $ 3,308,521 | $ 6,055,503 |
| Step Two | | | | | |
| Rates | | 0.4743 | 0.4311 | 0.3924 | 0.3591 |

[30] Note rates are based on SA/HSEA previously submitted rates attached to its Opening Statement of Position and assumes no monetization of State Tax credit and remains flat over a 20 year period.

| | | | | | |
|---|---|---|---|---|---|
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 11,175,818.35 | $ 1,439,662 | $ 1,308,535 | $ 2,977,669 | $ 5,449,953 |
| Step Three | | | | | |
| Rates | | 0.42687 | 0.38799 | 0.35316 | 0.32319 |
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 10,058,236.51 | $ 1,295,696 | $ 1,177,682 | $ 2,679,902 | $ 4,904,958 |

| Hawaii | | | | | |
|---|---|---|---|---|---|
| Step One | | > 10 kW | >100 kW | >500 kW | >5000 kW |
| Rates | | 0.575 | 0.523 | 0.475 | 0.436 |
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 13,554,310.77 | $ 1,745,321 | $ 1,587,483 | $ 3,604,466 | $ 6,617,041 |
| Step Two | | | | | |
| Rates | | 0.5175 | 0.4707 | 0.4275 | 0.3924 |
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 12,198,879.69 | $ 1,570,788 | $ 1,428,735 | $ 3,244,020 | $ 5,955,337 |
| Step Three | | | | | |
| Rates | | 0.46575 | 0.42363 | 0.38475 | 0.35316 |
| kW | 19,000 | 2000 | 2000 | 5000 | 10000 |
| kWh | 28,835,730 | 3,035,340 | 3,035,340 | 7,588,350 | 15,176,700 |
| First year cost | $ 10,978,991.72 | $ 1,413,710 | $ 1,285,861 | $ 2,919,618 | $ 5,359,803 |

| | | Lanai | | Molokai | |
|---|---|---|---|---|---|
| Step One | | > 10 kW | >100 kW | > 10 kW | >100 kW |
| Rates | | 0.575 | 0.523 | 0.575 | 0.523 |
| kW | 2,000 | 500 | 500 | 500 | 500 |
| kWh | 3,035,340 | 758,835 | 758,835 | 758,835 | 758,835 |
| First year cost | $ 1,666,401.66 | $ 436,330 | $ 396,871 | $ 436,330 | $ 396,871 |
| Step Two | | | | | |
| Rates | | 0.5175 | 0.4707 | 0.5175 | 0.4707 |
| kW | 2,000 | 500 | 500 | 500 | 500 |
| kWh | 3,035,340 | 758,835 | 758,835 | 758,835 | 758,835 |
| First year cost | $ 1,499,761.49 | $ 392,697 | $ 357,184 | $ 392,697 | $ 357,184 |

| Step Three | | | | | |
|---|---|---|---|---|---|
| Rates | | 0.46575 | 0.42363 | 0.46575 | 0.42363 |
| kW | 2,000 | 500 | 500 | 500 | 500 |
| kWh | 3,035,340 | 758,835 | 758,835 | 758,835 | 758,835 |
| First year cost | $ 1,349,785.34 | $ 353,427 | $ 321,465 | $ 353,427 | $ 321,465 |

By contrast, starting with lower prices would only delay the deployment of renewable energy. As HSEA articulated during the Panel Hearing,

> "this system of starting low and the going high basically ensures you're going to get nothing for a long time."[31] "The question is whether cost minimization is the appropriate goal. Obviously cost maximization isn't. But penetration, you know, potentially rapid penetration is also a goal. But even, you know, some meaningful penetration, I would argue, is also a goal here. And by starting as low as possible and creeping up, which would be completely consistent with the lowest, you know, cost minimization, you're basically artificially – not artificially – the effect you would have is to delay everything."[32]

### *9. Should the Utility have the option to purchase the renewable generation facility at the end of the 20 year FIT term?*

The Utility should only have the option to purchase the renewable generation facility at the end of the 20 year FIT term, if the developer and Utility chooses not to extent the contract on a month to month basis.[33]

However, the Commission rules on this issue, the developer "mostly just need to know what the treatment will be so we can get it priced when we're trying to raise capital. A contract where we own the asset at the end will offer ratepayers power at a lower rate than one in which we don't. And as an aside, I'd recommend for the – if I were the Commission, to push for contracts to include an option to buy power at a known rate after the Year 20 rate because my

[31] Tr. Vol. V at 92, lines 3-4.
[32] Tr. Vol. V at 92, lines 22-25 and 93, lines 1-6.
[33] In calculating the initial FIT rate, it should be assumed that the generator will have only salvage value at the end of the 20 year term.

sense is this is being underpriced in the current environment."[34]

***10. Ownership of the Renewable Energy Credits should remain with the Developer of the renewable generator.***

Ownership of the Renewable Energy Credits ("REC") are an asset to the Developer of the renewable generating facility and as such are not part of the FIT rate. The FIT rate would need to be adjusted higher if the Utility would like to purchase the REC. This is especially true since the Utility does not need the REC to meet its renewable portfolio standard under Hawaii law.

***11. Application, Queuing, Tracking, and Transparency.***

As a means to frame the application, queuing, tracking and transparency of the FIT, SA/HSEA previous noted the CSI program as a good model to follow because the contents of the CSI Handbook contains and addresses a large majority of the framework requirement for Hawaii's proposed FIT program.[35]

See: http://www.gosolarcalifornia.ca.gov/documents/CSI_HANDBOOK.PDF

***12. Conclusion.***

This proceeding to date has shown that there are many issues that must be addressed in the Commission's determination of the best design for a FIT and also assuring that ratepayers will get reliable energy at a just and reasonable rate. Although there are many issues that need to be answered, SA/HSEA's position is that the evidence clearly shows that PV technology is part of a best design for a FIT. In the long term, PV power provides the ratepayers with lower rates and has been proven to have a positive impact on the utility's system's grid.

Like the majority of the interveners in this proceeding, SA/HSEA began this proceeding

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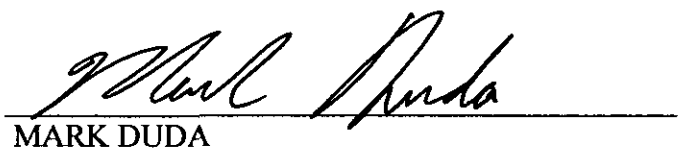
[34] Tr. Vol. V at 186, lines 1-10.

[35] the CSI framework is capacity based, (on system size), while Hawaii should have a performance based framework (kWh produced -require to quantify rate payer impact),

wanting to put in as much renewable energy on the HECO Companies' grid as quickly as possible and advocated for either no caps or very high caps. SA/HSEA still would like to have as much renewable energy on the HECO Companies' grid as quickly as possible, but it now understands that before this can happen the HECO Companies must proactively focus on immediate and ongoing grid improvements. These improvements, however, should not delay the FIT program when you have technologies such as PV that have proven track records in Hawaii that can accomplish the benefits of the FIT as articulated in the Energy Agreement. These improvements also should not delay the deployment of more renewable energy in Hawaii when you have ongoing programs like NEM that is working and technologies like PV that provide a good starting point for the initiation of a successful and properly implemented FIT program.

Respectfully submitted.

DATED: Honolulu, Hawaii, June 12, 2009



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Respectfully submitted.

DATED: Honolulu, Hawaii, 6/12 2009.

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CERTIFICATE OF SERVICE

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